Project Introduction

The Automated Real-Time Clearance Analyzer (ARCA) automates safety assessment of ATC decisions and can operate orders of magnitude faster (and on a wider range of information) than a human. ARCA's core algorithms mirror human safety assessments so that decision analyses are comprehendible on inspection and can be calibrated with experience and observation. Furthermore, ARCA archives operational data as it operates in the field, giving it increasingly better information from which to learn and make increasingly more accurate safety assessments. ARCA uses a Bayesian network to determine the estimated probabilities of incidents and accidents. ARCA's operational safety assessments are objectively linked to hard data. As in any estimation (human or automated), there are always uncertainties. However, ARCA does not rely on any heuristics or subjective integration algorithms. The assessments it produces are objective and quantitatively defensible based on its growing archive of operational information. This is a highly desirable characteristic of trusted automation.

Primary U.S. Work Locations and Key Partners
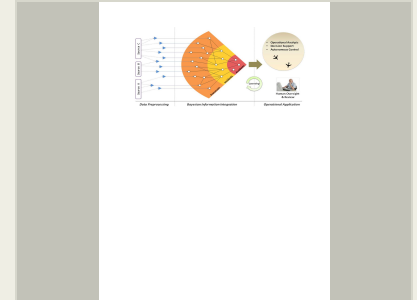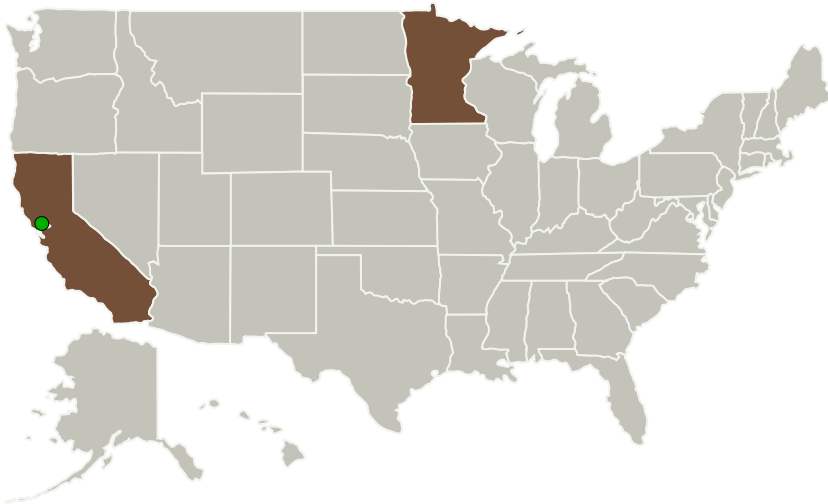

Automated Real-Time Clearance Analyzer (ARCA), Phase II Briefing Chart Image

Table of Contents

Organizations Performing Work	Role	Type	Location
Architecture Technology Corporation	Lead Organization	Industry	Eden Prairie, Minnesota
●Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Minnesota

Project Transitions

▶ **April 2017:** Project Start

✔ **April 2019:** Closed out

Closeout Documentation:
- Final Summary Chart(*https://techport.nasa.gov/file/140957*)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Architecture Technology Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
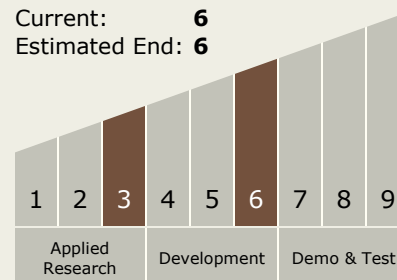
Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Rinehart

Technology Maturity (TRL)

Start: **3**
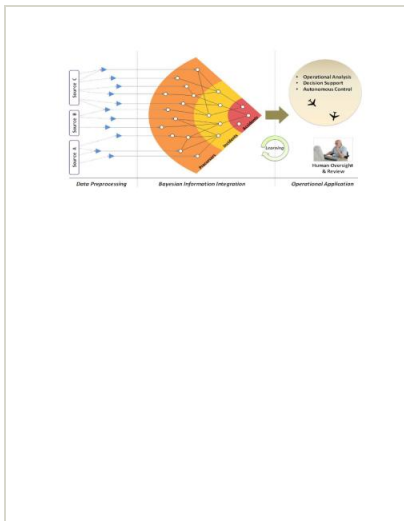Current: **6**
Estimated End: **6**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		

Images

Briefing Chart Image
Automated Real-Time Clearance
Analyzer (ARCA), Phase II Briefing
Chart Image
*(https://techport.nasa.gov/imag
e/136388)*
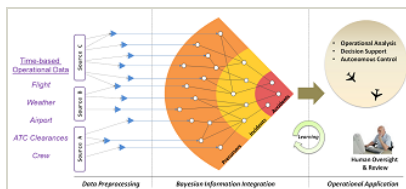
Final Summary Chart Image
Automated Real-Time Clearance
Analyzer (ARCA), Phase II
*(https://techport.nasa.gov/imag
e/129415)*

Technology Areas

Primary:

- TX16 Air Traffic Management
  and Range Tracking Systems
  └ TX16.3 Traffic
    Management Concepts

Target Destinations

The Moon, Mars, Outside the
Solar System, The Sun, Earth,
Others Inside the Solar System